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THE

WESTERN JOURNAL

OF

AGRICULTURE, MANUFACTURES, MECHANIC ARTS, INTERNAL IMPROVEMENT, COMMERCE,

AND

GENERAL LITERATURE.

PUBLISHED MONTHLY.

"Agriculture and the Mechanic Arts are the basis of civilization."

M. TARVER AND T. F. RISK,
EDITORS AND PROPRIETORS.

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THREE DOLLARS A YEAR.

IN ADVANCE.

Communications are invited upon the following subjects:—

1st. The Adaptation of the Climate and Soil of the West to Sheep growing, and the prospect of profit arising from this branch of husbandry.

2d. Upon the Introduction of Manufactures in the West.

3d. Upon the subject of Internal Improvement in Missouri and the Mississippi Valley in General, and the Locations which will best promote the General Interest.

4th. The Internal Commerce of the United States.

5th. The Mineral Resources of the Valley of the Mississippi.

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Between Pine and Chesnut Streets, in the same building with the United States Land Office,

ST. LOUIS, MO.

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VOLUME I. JANUARY, 1848. NUMBER I.

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THE WESTERN JOURNAL.

VOLUME I.] JANUARY, 1848. [NUMBER I.

ARTICLE I.

The objects proposed by the Editors of the Western Journal.

The combination of knowledge with labor, may be regarded as the only means of securing to the industrial classes their legitimate position in the ranks of civilization.

It is not sufficient that these classes should be acquainted with the details of the arts in which they are employed.—They must advance a step further, and enlighten their minds with a knowledge of the science connected with their several pursuits: and they should, also, understand the relation which exists between the producers and the consumers of all the leading articles of human comfort.

Owing to the diversity and variety of human wants, a large portion of mankind must necessarily be employed in producing articles for the use and consumption of others; and hence arises the necessity of an exchange of products: the means of making these exchanges, so as to promote

the interest of all classes, constitutes one of the great problems of political economy; and is alike interesting to both the producer and consumer. The nearer these two classes can be brought together—other things being equal—the greater will be the advantage of each; for, it must be borne in mind, that the labor and capital employed in these exchanges, add nothing to the quantity or quallity of the article, therefore, if we analize the subject, we shall discover that the merchant and the carrier derive all their support and profit from the labor of the producers; and hence it follows as an inevitable result, that the greater the distance and cost of making the exchanges, the greater will be the burthen imposed upon the producing classes. For, although the merchant and the carrier, are necessary agents, yet viewed abstractly, they may be considered as constituting a previledged class.

Impressed with the truth, as well as the importance of these propositions, the Editors of the "Western Journal" have entered upon its publication, with the design of collecting and laying before the people of the Mississippi valley, that class of facts and information which relate to the varied pursuits of the People. And, to enable them to do justice to the work which they have undertaken, they respectfully invite the agriculturist, the merchant, the manufacturer and the miner, to furnish the Journal with such facts and information as may be deemed useful and interesting to the public.

The Western Journal will contain an account of all valuable discoveries and improvements in agriculture, manufactures, and the mechanic arts.

The leading and more important statistics of the agriculture, commerce, manufactures, mining, &c., of not only the Mississippi valley, but of the whole country, will be collected with care and fidelity, and laid before our

readers in as concise and clear a form, as their nature will admit.

It is our wish to collect at as early a period as practicable, a full and complete account of all the manufacturing establishments of whatsoever kind in the Mississippi valley; to the end, that we may be enabled to note the increase from year to year, so long as our Journal shall be continued.

Considering internal improvements as one of the great social agents of the age, we shall collect and publish such facts and information touching this subject as may be deemed useful to our readers.

Believing that our Republican form of government can only be sustained by the virtue and the intelligence of the people; we shall advocate the importance of establishing an efficient system of Education in the State of Missouri; one that shall secure sufficient instruction to every free white child within our limits, to enable it to read the Holy Scriptures and the Constitution of the State, and also, that each elector may be able to write his own ticket at the polls of an election. To enable us the better to promote this important object, we shall be pleased to receive and publish the plans and suggestions of such patriotic individuals as may be willing to connect their names with this subject.

In the absence of more important and interesting matter, we shall endeavor to furnish our patrons with original essays upon the various subjects connected with the objects of our Journal; but we entertain a hope that the intelligence and public spirit of the people of the West will in due season relieve us from much of this labor by furnishing matter more interesting than our own productions.

We shall neither write nor publish any article, which has reference merely to the politics of the State or gen-

eral government; but in treating every subject which comes properly within the range of the objects proposed by this Journal, we shall seek for truth, and endeavor to establish it by the aid of reason, without reference to the private, or political opinions of others. Unfortunately, political opinions have reference mainly to expedients, and change with the causes which give rise to them;—we aspire to an object more permanent—we aim to direct the mind of all classes to what we esteem their true interest, and to afford all the light in our power to direct them in its pursuit. We wish to see the almost boundless resources of this great valley developed, and to connect our humble names with its history.

ARTICLE II.

The Geology and Mineral Resources of the State of Missouri.

INTRODUCTION TO THE SUBJECT.

No geological survey having as yet been made of the State of Missouri, we conclude that information in relation to its geology and mineral wealth, will be both acceptable and interesting to our readers.

Impressed with this opinion, and urged by a desire to procure such information from a reliable source, we addressed a note to Doctor H. A. Prout, of this city, requesting him to furnish us with the result of his scientific researches in reference to this subject.

The following communication from the Doctor, in reply to our note, will advise our readers that he has generously consented to prepare for publication in the Western Journal, a series of numbers upon the geology of Missouri, and the adaptation of its natural resources to the wants of its population.

From the contents of this communication, we are authorized to expect something more than a mere descrip-

tion of rocks and minerals. The writer indicates a design to discuss the subject with reference to both the physical and moral uses of the geological and mineral constituents of the earth: this manner of treating a subject, which is considered dry and uninteresting by the general reader, will impart much value to these essays, and render them both useful and interesting to all classes.

GENTLEMEN—I acknowledge the receipt of your note, in which you request me to offer you such information as I have collected in my investigations of the geology and mineral resources of the State, and of the Mississippi Valley generally. A partial knowledge, gained by a few excursions through the country, and from details furnished by others, not always to be fully relied upon, would, perhaps, render any attempt to embody the facts connected with this subject, a work difficult in its execution and in some measure unfruitful in its results. But owing to a general and increasing desire for geological knowledge, and the great benefits which may flow from even a partial understanding of the nature and extent of our mineral resources; and knowing the influence which early and even imperfect discussions may have on future investigations upon this subject, I feel encouraged by your polite invitation, to throw together such facts as I have obtained; hoping that the future labour of others may fill up the incomplete sketches which I may draw. The field is extensive, and the subjects embraced by it affect more or less the interests of every calling and class of men. For the natural wealth of a country consists in the mineral treasures which are distributed below its surface, and the physical adaptation of its soil to the production of the staples on which human industry is expended, and by which human life is sustained.

In comparing the advantages possessed by different countries, in the distribution of these two great sources of national wealth, we find much diversity. It seems that by a providential arrangement, a country which is liberally en-

dowed with the one is deficient in the other; and the exceptions to this order are, where there exists a seeming adaptation of the one to the wants and purposes which necessarily grow out of the other. The more precious metals are seldom found except in countries characterized by the arenaceous nature and general sterility of their soil; but being of great value in proportion to bulk, they are easily transported and exchanged for such of the appliances and conveniences of life as the earth fails to yield. The metals which are more useful in forming and fashioning the impliments of agriculture, and the instruments and engines of the mechanical arts, are found associated with great store houses of appropriate fuel, in districts of country eminently adapted to the pursuits of agriculture.

In view of this distinction of natural resources, there will be little difficulty in showing that our own State is peculiarly favored by such a distribution of these advantages as affords all the elements of national greatness and national prosperity, giving to the industry, the energy, and the enterprise of its citizens ample scope in the future development of the resources of the State. Without the knowledge furnished by the experience of the past, and the flood of light which has been thrown out by the modern discoveries in science, its soil might become exhausted, or rather plundered, and its wealth squandered, without promoting materially the well-being and happiness of its people, or their progress in the great march of civilization and refinement. To illustrate the truth of this proposition we will merely institute a comparison.

The number of silver mines in Mexico has been estimated by Humbolt at about 3000. Its soil is admirably adapted to the production of some of the best staples of human subsistence. It has consequently both elements of natural wealth—but these have been as yet imperfectly developed, and have contributed but little to the advancement of individual or national prosperity. For the abundance of the spontaneous fruits of the earth, and the little labor required in procuring them, together with the enervating influence of an almost inter-tropical climate, have

rendered its people too indolent to profit by their advantages, or to make much progress in social happiness or national wealth.

England, on the contrary, is limited in its extent, when compared with the Mexican provinces. But possessing the best association of natural resources, and being favored with a climate which is peculiarly adapted to the development of the physical and moral energies of man, its prosperity stands unrivalled among the nations of the earth. Her agricultural resources, though at one time exhausted, have been improved by the application of the principles of modern chemistry. Her manufactures borrow the elements of their fabrics not only from her own bosom, but from the broad surface of the globe—her commerce whitens every ocean, and her navy stands as graceful memorials of the extent and grandeur of her power. What England has attained by the best application and disposition of her natural resources, might be attained by Missouri through the operation of similar causes, for the same elements of power and advancement exist in the one which exist in the other, and nothing but a gross misapplication of principles, or an abuse of our resources, can prevent us, as a people, from making rapid strides in national prosperity.

Owing to a temporary absence from home, it will not be in my power to furnish you with any other communications until my return. The first of the series will embrace an exposition of the general classification of the rocks, according to the more modern divisions of geology, this being necessary to an understanding of the discussions which follow. The economical geology of the State will then form the subject of consideration, and the adaptation of the resources of the State to the various purposes of life, will close all we wish to embrace in these numbers.

Yours, respectfully,

H. A. PROUT.

ARTICLE III.

THE ECONOMY AND HABITS OF PLANTS.

The effects of climate on the habits of Plants, Indian Corn, Cotton, Irish Potatoe, Potatoe-Rot.—Mean annual temperature, Meteorology, Dew, Winds, Fruits, Grapes.—Effects of light, and the influence of the Moon upon the growth of plants.

The vegetable kingdom is the medium through which the properties of inorganic matter are elaborated, and made suitable to the purposes of food; and it is through this medium alone, that the animal kingdom derives the means of its subsistence.

This arrangement in the economy of nature, is so immediately connected with, not only the existence, but the moral condition of man, that every fact relating to the economy of plants, is worthy of attentive observation.

To the individual of learning, or taste, the vegetable kingdom affords a boundless source of pleasure, as well as instruction; and is eminently calculated to direct the mind to the contemplation of the wisdom and benevolence of the Creator.

To the practical agriculturist, a thorough knowledge of the economy and habits of plants, as also the causes which influence their growth and developement, is highly necessary, for without this knowledge, he is not only liable to misapply his labor, but must remain in ignorance of those moral pleasures which were designed to be associated with his employment.

Our design in the present essay, is simply to notice the economy and habits of the vegetable kingdom, and the effects produced upon plants by change of climate, without reference to their cultivation.

The geographical location of plants, is determined by the degrees of temperature, rather than latitude; but owing to a diversity of altitude, as well as a diversity in the mineral constituents of the soil, it rarely happens that any one plant takes possession of a large district of

country, to the entire exclusion of others. Hence, several families as well as varieties are frequently found growing within a limited district, and sometimes mingle in close proximity to each other. Some, however, are so select in regard to temperature, soil and moisture, that they confine themselves within very narrow limits, and cannot be produced beyond, without arrangements highly artificial; while others more hardy and enterprising, ramble far from that, which would seem to be their original place of location. In their migrations, they conform to the changes of climate, soil, and other circumstances connected with their new location; and while undergoing the modifications incident to these changes, they are transformed into distinct varieties. Hence, the more extensive the range in which a plant is found, the greater is the number of varieties into which it is divided; these varieties, however, rarely depart so far from the family resemblance but that they are readily recognized as descendants from the same stock.

The cerial tribe in some one or more of its forms, is found on every part of the habitable globe, where there is sufficient fertility of soil to sustain vegetable life; and is divided into a greater number of varieties than any other tribe of the vegetable kingdom. From this is derived perhaps nine-tenths of the food of both man and beast, in most civilized countries; but it is a fact worthy of observation that none of those varieties which are cultivated for bread, have been found growing wild, in any of the countries which have been discoved in modern times. This is the more remarkable, when we reflect that within the last four centuries, new countries have been discovered in every climate that can be inhabited by man.

Many trees are found bearing fruit in their wild and uncultivated condition; and man may eat of the herb of the field, but in the sweat of his face only, may he eat bread; for without culture, none of the grain-bearing varieties of the cerial tribe will bring forth fruit. But to compensate for this necessity of cultivation, nature has adapted some one or more of these grain bearing plants, to every climate that can be inhabited by civilized man.

Of all those plants, one only, is indiginous to our continent; and this is so remarkable in its economy, and so important as an article of food, that we shall notice it as an illustration of the effects produced by change of climate upon the vegetable kingdom.

In the United States, the region of the most perfect developement of Indian Corn, [*Zea Maiz*] may be considered as extending from about thirty-three to thirty-nine degrees of latitude; it is however, highly productive on both sides of this belt. But as we proceed north, from about latitude thirty-nine, the plant gradually becomes smaller, and the size of the ear diminishes in proportion. This decrease in the size of the plant, for the first two or three degrees, is compensated by the increased number which may be grown upon a given quantity of ground; but as we proceed still further towards the north, the number and size of the grains produced by a single plant, become so much diminished, that the increased number of plants, fail to make the crop equal to that of the true corn growing region; and thence, as we proceed north, the value of the plant rapidly decreases. But still it continnes to accommodate its habits to the climate, and to produce seed, until loosing its large and beautifully developed proportions, it returns to what may be called a grassy state, and produces the seed upon the top of the stem, instead of the ear, which in a more favorable climate shoots out from about the middle of the plant. These changes are the effects of climate merely; but the general economy of the plant is remarkable in many other respects. It delights in a deep and well pulverized pasture, and sends out its roots to feed at a great distance from the stem; from these roots, innumerable small fibres, or radicals branch off, and take complete possession of the whole mass of pulverized earth near the plant, except a small portion at the surface. When the plant is in this condition, one might conclude, that if these roots were broken up by the plough, it would perish; but as they can only perform the office of feeders at their extremities, when that part of the earth nearest the plant has been once completely overrun, it ceases to contribute to its support;

and hence it is important to break these roots, that the plant may send out a new race of feeders, into a new pasture, improved by the chemical effects produced by pulverizing the soil.

The plant requires a high degree of temperature to stimulate its developement; but it takes care to protect itself from the heat of a burning sun; and its arrangements for keeping cool, during a hot day, is most admirable. In the first place, the stem is very succulent, and contains a large quantity of fluid; and to prevent this fluid from evaporating too rapidly, a leaf is attached to each joint, the footstalk of which, forms a wrapper that encases the stem to the next joint above, leaving a small space between this wrapper and the stem, which forms a reservoir for holding water; the leaf is smoth upon the upper surface so as to reflect the heat, and being depressed in the centre, and more elevated at the extremity than at the base, it serves as a conductor to the dew which is formed in globules upon the smooth surface, and carries it to the reservoir at the base of the leaf. By this admirable contrivance, if the dews have been copious during the night, a sufficient quantity of water will have been collected, to supply the plant with moisture, and to keep it cool by evaporation during the heat of the day; and thus it rejoices in comfort while other plants are drooping around it.

From these causes, it is better calculated to resist draught or to recover from a bad state of cultivation, when the cause is removed, than perhaps any other plant. When the grain has matured, the ear, which was erect while growing, becomes pendant, and being covered with a strong husk, is protected, as well from the rains, as from the ravages of small animals and birds; thus evidently proving that the economy of the plant has reference, not only to its growth, but to the preservation of its seed also.

When these, and many other remarkable traits, in the character of this plant are considered, the mind is so forcibly impresssed with the obvious design evinced in the arrangement of all its parts, that we are almost ready to conclude that it is a thing of intelligence, rather than a mere plant.

From these peculiarities in its economy, and its wonderful elasticity in recovering from adverse circumstances, it is the most certain of all crops known to man; and it may safely be predicted, that if planted in due season, and cultivated with skill, that a crop throughout the corn-growing region of the United States, would not fall twenty per cent. below the general average, once in a series of one hundred years. And when we consider that it is abundantly more productive than the other grain-bearing plants, and that a greater number of crops may be raised upon the same ground, in any given series of years, we must conclude that the middle region of the United States is capable of feeding a much larger number of people with bread than any other country of eqnal extent of territory upon the globe. This gives to the corn-growing region of the United States an importance which has not usually been attached to it; for the fact of this being the great provision region, and located in the centre of the Union, must, in time, regardless of artificial circumstances, give it the control, not only of the policy, but of the capital and commerce of the whole country; for labor will sooner or later perceive and appreciate the advantages of locating as near as practicable to the point where the necessaries of life are produced.

We have digressed somewhat from our subject; but the article of Indian corn is so purely American, and the region of its production so peculiar in its relation to the other parts of the Union, that we felt almost compelled to notice it, as one of the prominent elements of American greatness.

The cotton plant, (*Gossipium*,) is another remarkable instance of the effects produced upon plants by transferring them from one climate to another. This plant is perennial in the torid zone, and grows there to a sufficient size to be denominated a tree; as it is removed towards the north, it gradually diminishes in size, and after passing the latitude of about thirty degrees from the equator, it changes from a perennial to an annual plant; and losing the fibrous tissues which belong to the tree, it becomes herbaceous.

As it progresses towards the north, it continues to diminish in size, until reaching the latitude of from thirty-seven to thirty-eight degrees, it ceases to reproduce itself. In tracing its habits and economy we discover that in the torid zone, where the life of the plant is protracted to many years, it does not seed so abundantly as it does when, by change of climate, it becomes an annual plant; for the reason that there is less necessity in the former case of making provision for the perpetuation of the species. Furthermore, in the torid zone there is no necessity of protecting the seed when ripe, so as to preserve them until a particular season of the year; therefore, they are smooth, and, with the fibre, which is very loosely attached to them, fall from the pod almost as soon as it is open. When the plant becomes annual, the fibre closely adheres to the seed, and serves as a protection against moisture, and in the more northern parts of the cotton-growing district, the seed, with the fibre attached to them, remain in the pod all winter, and are thereby preserved in a sound condition. Thus we perceive a series of calculations, apparently the result of a reasoning faculty, all tending to the protection of the plant against the change of climate. Like Indian corn, it has its region of greatest productiveness; which, in the United States, extends from about latitude thirty-one to about thirty-five north; and it may also be observed, that, like Indian corn, in another respect, the further north it is planted, the greater is the number of plants which are necessary to be grown on a given quantity of ground, to insure a profitable crop. No other material, so suitable for clothing, which has yet been discovered, can be produced in so large a quantity, upon a given area of land, as the article of cotton; and in no other country are the seasons so favorable for its production, as in the United States, except perhaps in some parts of South America. This is another important element of our national greatness; and it is worthy of observation, that the regions of indian corn, and of cotton, are not only in close proximity, but, that they run into each other, and give us the control of the two greatest staples known to man, the one to feed, and the other to cloth, the inhabitants of the earth.

The Irish potatoe, (*solanum tuberojum*) presents another remarkable instance of the effects produced upon plants by a change of climate, This plant is of little value within the tropical climate of America, where it was first discovered by Europeans; but when transferred to, and cultivated in colder climes, it becomes one of the most prolific food bearing plants known to man. It is a fact generally known to the people of the United States, that the potatoe gradually improves in quality as we proceed from the gulf of Mexico to the northern Lakes. This improvement in the quality of the potatoe, we suppose to be produced by the economy of the plant in protecting the tuber from the greater degree of cold in the more northern latitudes. It is a common practice with the planters of the south to procure seed potatoes from the more northern districts; and no one doubts, that, the first crop from these seed is much better than potatoes grown from those raised in the south. The potatoes raised the first year from northern seed are considered but little inferior to those produced further north; after this they rapidly decline, and in two or three crops become adapted to the climate and are no better than other southern potatoes. This plant propogates from both the flower seed and the tubus; this provision in its economy evinces the extreme care which nature has taken to ensure the perpetuation of its species against accidents which might possibly happen to the seed produced from the flower. The inherent, and natural mode of propogation is by the flower-seed, and the tuber is a mere adjunct, to be used as an expedient in case the flower seed should fail; and is to be considered simply as a part of the old stock.—Hence, in time, the offspring from the tubus is liable to decay, upon the same principle that a particular variety of fruit decays by being propogated for a long time by grafting.

From this view of the economy of the plant, we are naturally led to submit a few suggestions upon the subjet of disease known as the "Potatoe-rot." When we subject a plant to cultivation, it is important to study its economy, and understand its native or normal habits; to the end that we may give them the proper direction without do-

ing too great violence to its nature. Therefore, to insure the largest, and most permanent advantage from the culture of the potatoe, we must conform to the original economy of the plant, by propogating from both the seed and the tubor. The produce of the first year from the flower seed, is too small for the purposes of food, but it should be frequently raised for the purposes of planting; otherwise, violence will be done to the economy of the plant, which will induce a tendency to decay; and although the race may survive for many years, yet from its enfeebled condition it is rendered liable to injury from causes which would not affect it, if it were in a more healthy state.

It becomes less capable of resisting unusual changes of temperature, and unusual seasons of draught or moisture, it is more choice in its location, and requires a soil and culture congenial with its diseased condition; and, finally, it is more liable to the attack of insects, and the fungie, many of which are doubtless bred upon the plant by reason of its state of incipient decay. Many causes have been assigned for the potatoe-rot, and some of them are probably true, but we think these must all be regarded as proximate causes merely; and that the first cause is the violation done to the economy and habits of the plant in continuing to produce it from the tuber beyond the time limited by the laws of its nature; and until this cause is removed the plant will be liable to fail from many causes and accidents which would never happen, or, if happening, would not affect it were it in a healthy and vigorous condition.

Aware that many learned men have been ingaged in the investigation of this subject, we have offered these views with diffidence; but believing that they are predicated upon true principles of natural economy, we submit them for what they are worth. A few years of experiment and observation would be sufficient to test the principle, and if it should be found true, it will more firmly establish the value of the Potatoe, as well as the capacity of the potatoe producing districts to sustain their population; and besides restoring the inhabitants of those districts to a state of plenty, it will impart con-

fidence in the future prosperity of the country. The people of the United States as well as of Europe are deeply interested in this subject; for, notwithstanding the potatoe has not suffered so much here as in Ireland, yet, if the cause of this disease be what we have supposed, it must soon become destructive to the crop here as well as in other countries; and the sooner the true cause can be ascertained the less will be the danger of suffering from it.

The potatoe is another of the great staples of America, and takes its true position on the northern confines of the corn growing region; and will enable our most northern districts to support a population much greater in numbers, than could have been sustained by the growth of any other plant in that region. By the culture of the potatoe our most northern districts are capable of supporting as dense a population as almost any other part of the Union; provided, the health of the plant can be permanently relied upon. Owing, however, to its bulky and perishable nature, it can never enter largely into commerce so as to make it a sourse of great wealth to the country.

It is a very remarkable fact in the history of the potatoe, that the plant should have been produced by nature in a climate so different from that which is best adapted to its usefulness, and, that, from being little better than a worthless weed, it should become the means of supporting so large a portion of the human family, not only on the continent of its discovery, but in Europe and Asia also.

The history of many other valuable plants would be found both curious and interesting, but these must suffice for our present purpose. We have selected those which are most important, as well as most familiar to the American people, that the reader might have an opportunity of comparing our observations with his own, as well as of testing the soundness and accuracy of our deductions.

The meun annual temperature of a given district of country cannot be relied on as a correct indication of its suitableness to the production of a particular plant; to en-

able us to judge whether a certain plant will succeed in a given climate, we must first understand its habits and economy, and by ascertaining both the mean and extreme temperature, as well as the duration of winter and summer, and also, of spring and autumn, we can then form an opinion in regard to its adaptation.—In the United States, the difference betwen the mean temperature of winter and summer is much greater than in Europe; hence many annual plants which require but a short time to grow and ripen, are produced in great perfection in this country, which would not mature in those even where the mean annual tempearature is perhaps much higher. On the other hand, many perennial plants will stand the mild winters of Europe, which cannot survive the frost of our climate of equal mean temperature.

The meteorology of a country exerts an important influence upon plants; and should be studied and understood by all who are engaged in either agricultural or or horticultural pursuits. The quantity and frequency of both rain and dew are influenced by causes readily ascertained by observation, and are generally determined by the peculiarity of location. In a country which is diversified by mountains, or high hills and deep vallies, a very short distance frequently makes a great difference in the quantity of rain that falls, especially in summer, when rain is most required.

Dew is formed more abundantly in vallies and near water courses, than in more elevated and exposed situations; and is favorable or otherwise to the growth of plants according to their nature.

Winds, also, exert much influence upon the growth of vegetation by accelerating evaporation, and depriving succulent plants in dry situations of the moisture necessary for their more perfect developement; elevated table lands, or, other localities exposed to constant or unusual currents of wind, are therefore unfavorable to the growth of plants which require much moisture. And furthermore, unless these winds should come from the direction of the Equator, they lower the temperature in the spring season, and greatly retard the growth of tender plants.—

We have frequently observed the growth of the young cotton plant to be materially affected in the northern part of the cotton growing region, by exposure to western winds.

All these meteorological phenomena, as well as change of climate, tend more or less to modify the habits and economy of plants; and they are therefore highly worthy of the observation of every individual who is in any way interested in their cultivation, either for use or ornament.

A thorough knowledge of these subjects would save much labor as well as expenditure that is often lost by experiments, which, owing to physical causes can never succeed; and would enable the agriculturist to select from the whole vegetable kingdom the plants which were best adapted to his particular locality.

From some one or more of these causes it often happens that a certain plant which succeeds well in one locality cannot be profitably produced upon a neighboring farm; and hence we frequently hear it said that an individual is not lucky in producing some particular plant. This want of luck, is, doubtless in many cases, owing to the want of skill and industry; but it is nevertheless true, that many individuals labor, through perhaps their whole lives, against some of these causes, without ever having discovered the reason of their failure. And such must continue to be the case, until the agriculturist shall become better informed in regard to these subjects; and in the mean time, the word "unlucky" should be understood as implying ignorance, rather than mischance, or accident. To the individual who should desire to purchase a farm for the purpose of producing any certain plant, a knowledge of the local causes which influence its growth, would be of great importance in directing him in the choice of a suitable location.

All the cultivated fruits are very choice in their location; and some of these are so peculiar in this respect, that no artificial means have been found sufficient to make them productive and well flavored in locations uncongenial to their nature. Some of the European fruits have hitherto resisted all our efforts to naturalize them, so far

as to make their cultivation profitable in this country; and this is especially the case in regard to the grape.

Having heretofore neglected our own native varieties, we are but just beginning to learn, after the experience and disappointments of two centuries, that foreign grapes can not be successfully cultivated in the United States. Had this fact been known and appreciated one hundred years ago, many varieties which have no doubt been destroyed and lost, would have been saved, to the great advantage of the country; and we should, in all probability before this, have been so far advanced in the business of grape-growing as to have produced a large portion of the wine required for our own consumption. This, besides being an important source of national wealth, would have had the moral effect of lessening the use of ardent spirits in the grape-growing districts. It is wonderful, that it should not have occurred to the people of the United States, in all this time, that there was some physical cause controlling this subject which could not, in the nature of things, be removed. And observing, as they must have done, the abundance and variety of native grapes which grew in almost every part of our territory, it is still more wonderful that they should have neglected for so long a time to cultivate and improve them. But such has ever been the blindness of the human mind, that many of the most valuable and obvious gifts and provisions of nature have remained overlooked and neglected for ages, until by accident or necessity they have been discovered and improved.

This delusion in regard to the cultivation of the foreign grape, however, has at length been dispelled, principally through the intelligence and persevering enterprise of N. Longworth, Esq., of Cincinnati, and others, who deserve the gratitude of the American people for their labors in thoroughly testing the value of both the foreign and native varieties. From these enlightened exertions, history will date the origin of successful grape-growing in the United States; a branch of industry which in time must exert a most salutary influence upon the habits and morals of the people, and add greatly to the wealth of the nation.

Light exerts a powerful influence on plants throughout every stage of their growth; and it is so intimately connected with their habits and economy, that the nature and extent of this influence is an important subject of consideration. The influence of light upon plants has no doubt been observed by almost every one who is at all acquainted with vegetation; but as yet, few seem to have studied its importance. That this influence has no relation to the heat which usually accompanies the rays of the sun, we think is sufficiently proven by the fact that, when a plant germinates, or is placed in the most remote part of a cellar, it will invariably incline to the direction of the light, no matter how feeble may be its rays.—Under such circumstances, we cannot imagine that the least appreciable warmth can be imparted by the light. The buds of most tender plants are attracted towards the sun, and follow its course throughout the day; the trees upon the edge of a forest incline towards the open space; and the time of ripening, as well as the flavor of fruit, is much influenced by its exposure to light. Indeed, the whole vegetable kingdom seems to abhor darkness, and appears to be ever struggling to avail itself of the greatest quantity of light which can be obtained.

These facts have suggested the consideration of a subject, which as far as we know has never been treated by any writer in connection with the habits and economy of plants. We allude to the influence which the moon is supposed to exert over the vegetable kingdom. The opinion that the moon exerts an influence upon vegetation, although ridiculed as absurd and superstitious, prevails in the mind of a very large portion of both the people of Europe and America and some of the most intelligent and successful agriculturists of our acquaintance have been in the habit of conforming this time of planting many varieties of seed to the particular stages of the moon; yet we never conversed with any of these who pretended to assign any cause; they merely believed in the *effects*, but the cause remained a mystery.

The discovery of these effects was in all probability the result of observation merely; and a belief in the influence of the moon having been established upon that

ground, it has been acted upon and transmitted from age to age. Many ancient customs which we are wont to denominate superstition, have no doubt been established on the same foundation: they should be respected for their antiquity but not blindly followed without investigation. By instituting a new series of observations, their truth and utility would be tested, and if they should be sustained by accurate observation, their benefits would be enlarged; but if not thus sustained, the public mind would be benefitted by relieving it from error.

That the light of the moon exerts an influence upon vegetation can scarcely be doubted: proceeding upon this proposition we must arrive at the conclusion that, if this influence is beneficial, the growth and value of a vegetable would be increased by planting the seed at a time when the more important and critical stages of the plant would receive the greatest quantity of light. Suppose for instance that the germinating, the flowering, and the ripening stages should be most benefitted by light: in this case, by observing the length of time which a certain plant under ordinary circumstances requires to mature or ripen its fruit, the time of planting might be so arranged as to bring one or more of these several periods within the light of the moon. If it should be established by observation that the germinating state was the most important, in that case the calculation need proceed no further than simply to determine the stage of the moon when this process was best promoted.

Admitting the influence of light upon vegetation, we conclude that a plant which should come up at a time when the moon shone during a considerable portion of the night, and was on the increase, would grow with more vigor than if it should come up when the light of the moon was decreasing. Upon this principle we may perceive that the growth and development of the root, as well as the stem and fruit, would be affected by a greater or less quantity of light. For instance, we have frequently heard the remark that turnips and other root-bearing plants had run too much into foliage, and therefore, the roots were of but little value. Now if that stage of the plant at which the character and development of

the root is determined, should happen when the moon afforded the greatest quantity of light, the growth and development of the stem and foliage would be stimulated and enlarged at the expense of the root.

We do not wish to be understood as offering any opinion in regard to the best time of the moon for planting the seed of any particular vegetable; our remarks upon this subject are designed to illustrate the effects of light upon the vegetable kingdom, rather than to examine the details connected with its application to the growth of any particular plant.

If, however, this theory of the influence of the moon upon plants should be correct, the practical farmer will have no difficulty in applying it to any plant which he may desire to grow; and by instituting a series of observations, he would in time be able to avail himself of all the benefits of the moon, as well as of the earth, for the purposes of agriculture; and a belief in the influence of the moon would no longer be considered ridiculous and superstitious.

The agriculturist who possesses a thorough knowledge of the economy and habits of plants, and the various influences to which they are subjected by physical causes, is not only in a condition to make his labor more profitable, but has enlightened his mind by one of the most pleasing and interesting subjects in nature; a subject in which the design of the Creator is so obvious that he could not doubt if he desired to do so. Unlike chemistry, geology, and other sciences connected with agriculture, this requires but little acquaintance with books: it is written in legible characters in the book of nature; and, once initiated, the student requires neither teacher nor glossary to define its meaning. The illiterate ploughman, whose mind shall have been directed to the subject, will quickly learn to read and comprehend the works of nature. What a relief must it be to the mind of the laborer to converse with and receive instruction from those things which are connected with his daily employment; instruction, too, so pure, so refined, and so unalloyed by human passion, that it cannot fail to improve his heart and make him a better man.

We ardently desire that the tiller of the ground should at least keep pace with the mental and moral improvement of those engaged in other industrial pursuits. To do this he must avail himself of every advantage which may be derived from the discoveries of the age, and also make himself acquainted with the principles and agents connected with his employment. If he neglects to do so, he cannot expect to maintain a position in the progressive improvement of the age equal to that of those who are engaged in other pursuits; and instead of occupying, as he should, the highest position in society, he must take his station in the lowest.

ARTICLE IV.

WESTERN STAPLES.

Wheat and Flour, Indian Corn, Barley, Oats and Rye, Hemp, Tobacco, Lead, &c.

The value of the exports of a country, is the only true criterion by which we can judge of its ability to purchase and pay for foreign products; therefore, it is important that every individual should possess correct information in regard to both the exports and imports. It is mainly owing to the non-observance of this proposition that our country has so frequently suffered from pecuniary revulsions; and, that so many individuals are unsuccesful in pursuits which to the common mind appear plausible, and wisely selected.

Appreciating the importance of correct information upon this subject, we design to lay before our readers all the authentic information which we can procure in relation to the exports and imports of this part of the Mississippi Valley.

The difficulty of collecting facts in time for our first number prevents us from doing more at present than to notice the quantity of some of the principal staples that have been annually received at St. Louis, for a few years past. We impart our information as we receive it, but we are assured that it comes from the most reliable sources.

Owing to the want of more thorough information in

regard to the subject, we shall only make such deductions as may seem to flow naturally from the facts before us, and leave our readers to draw their own conclusions in regard to prices.

WHEAT AND FLOUR.—The recent distresses of Europe, added to a rapidly increasing home demand, have given an importance to these articles which places them first on the list of western staples. But few years have elapsed since so little attention was paid to the culture of wheat in this and the adjacent States, that nearly every barrel of flour consumed in this market came from the Ohio river. The industry of a rapidly increasing population, however, has wrought an entire change in the trade of this article, and now, much of the wheat and flour consumed on the seaboard, beside the vast amount annually shipped from New Orleans for foreign markets, are the product of Missouri, Illinois, Iowa and Wisconsin.

The following statement will show the rapid increase in the production of wheat within the last few years. The receipts of this staple at St. Louis for the year 1843 were 558,953 bushels; 1844, 720,663 do.; 1845, 971,025 do.; 1846, 1,838,936 do.; while, judging from present indications, the amount received during the present year, 1847, will be at least 3,000,000 bushels, or nearly six times the quantity brought to market in 1843, only five years ago.

In like manner the manufacture and sale of flour have been rapidly progressive. Receipts at this port in 1843, were 81,479 bbls.; 1844, 96,203 do.; 1845, 139,282 do.; 1846, 220,457 do.; while, for 1847, they will probably reach 350,000 barrels. The manufacture of flour in this city in 1846 slightly exceeded receipts. It is the general opinion that, owing to the high price of wheat during the year 1847, the quantity of flour manufactured by the St. Louis millers will not exceed, if it equals, that which they turned out in 1846.

However flattering to our progress the foregoing statistics may be, the fact should not be concealed, that serious apprehensions exist in relation to the wheat crop of last harvest. It is generally conceded that the result

must show a very material falling off, and an advance in the wheat and flour markets, may be looked up to as a probable consequence.

Corn.—It is conceded on all hands that the crop of corn for 1847, will be larger than ever before known in the West. In addition to the more than usual quantity of soil at first intended to be planted, thousands of acres on which wheat had been sown and failed, were subsequently ploughed up and planted in corn. From this cause, the crop has been increased greatly beyond what it otherwise would have been.

Receipts of corn for the last five years inclusive, have been as follows: 1843, 81,767 bushels; 1844, (short crop,) 56,720 do.; 1845, 107,927 do.; 1846, 588,644 do.; 1847, (probably,) 1,200,000 do. The latter, of course, is not the *crop* of 1847, but of the year preceding.

The above, it should be remarked, although representing the amount brought to market, scarcely gives an accurate idea of the rate of increase in the quantity cultivated, and for the following reason: The high prices of corn which sprung up as the consequence of a scarcity of breadstuffs in Europe, induced our agriculturists to bring to market almost every bushel of their crops, not needed for home-consumption, thus diverting from other uses much that otherwise would not have found its way to market. Low prices during 1848, should they prevail, as they probably will, must produce the contrary result, and prevent much of the crop from going to market, and hence the gross receipts at this port may not exceed those of 1847,

Barley, Oats and Rye.—As these are articles mainly of home consumption, they do not require very particular notice. Receipts of Barley for 1843 were 7,785 bushels. The receipts for the present year will be about 70,000 do. Of Oats, the receipts in 1843 were 55,530 do.; for the present year they will probably reach 250,000 do. Previous to 1845, receipts of Rye were too trifling to deserve notice. In that year they reached some 3,000 bushels. This year they may be estimated at 10,000 do.

Hemp.—The culture of this article has greatly increased within the last few years. In 1843, the number of

bales received at this port was 37,523. Receipts this year will be in the neighborhood of 90,000 bales. The price, both of dew and water rotted, has ranged unusually high, being for the former, during the greater part of the year, from $80 to $90 per ton, and for the latter, from $150 to $175. Choice dew rotted, for a considerable portion of the time, has ranged from $100 to $115, and for a season as high as $130 per ton. These high prices will probably stimulate agriculturists to increase the production of the article.

The formation of the American Hemp Company of Jacksonville, Illinois, will constitute an era in the history of hemp-growing in the West. This company have furnished to the farmer new inducements to enter into the cultivation of hemp, by their illustration of the fact, that, by a process simple and easy, American hemp can be rotted, perfectly, in a few days; and that this article, when dressed in the usual manner, is equal to the best Russian; nay, better than any specimens of the latter article as yet imported into this country. The American steam rotted hemp is fairer in point of color, more flexible and soft to the touch, and is capable of bearing a greater degree of weight than any specimens hitherto imported from abroad. We may reasonably look forward to the period when our navy, as well as commercial marine, shall be entirely supplied with cordage made from hemp of American growth, and when Missouri, whose natural advantages in the production of hemp are not surpassed by those of any other State, may claim to supply by far the greater portion of such material.

Tobacco.—It is difficult to judge of the annual production of this article from the receipts, as, owing to low water, low prices, &c., a large portion of the crops have sometimes been held back, and the amount brought to market in such instances has fallen below that of a preceding year. Thus, in 1843, the amount sent to market (20,000 hhds.) more than doubled that of the preceding, as well as the following year. Indeed we think it likely, that were strict enquiry made, it would turn out that the crops of several preceding years have differed very little in quantity. Receipts at this port for 1844, were about

9,700 hhds.; for 1845, 11,564 do.; 1846, 8,588 do.; while for the present year they will probably be about 11,000 do. This shows very plainly that the culture of Tobacco does not in this State keep pace with other leading products. The crop is less certain than many others that pay equally well, and we shall probably find that as other agricultural products go on annually increasing—some doubling themselves—this one will remain stationary, or retrograde.

The crop of 1847, we learn, will prove smaller but far better, than that of the preceding year. Prices during the last year have been good, and if our information should be correct, the rates must advance during the present year.

LEAD.—The high prices of this staple which have ruled during 1847, have been a mystery to many dealers. Very little of the article, comparatively speaking, has been exported; the quantity produced from the mines is somewhat greater than for the year previous; yet the price has gone on improving, until it has reached a point seldom before known in this market. The only manner in which we can account for this, is the greatly increased consumption in the way of manufacture. Meanwhile, labor seems to be diverting itself from mining, and though our mineral resources seem almost inexhaustible, still it is a matter of serious question whether if greater enterprise be not manifested in rendering available our mineral wealth, our products may not in time fall below the demand for home consumption.

Receipts of Lead for the last five years, have been at this port as follows: In 1843, 584,431 pigs; 1844, 595,000 do.; 1845, 750,880 do.; 1846, 730,820 do.; and the present year, about 800,000 do. We are informed that the consumption by the manufactories of this city, within the present year, has nearly doubled that of last, and a much larger quantity than formerly has gone to the Ohio River.

ARTICLE V.

Relative Cost of Water and Steam Power, Advantages for Manufacturing in the Mississippi Valley, Coal Fields of the United States.

The following articles which we have taken from the Louisville Journal will be found interesting to all who feel an interest in the prosperity of the west:

The writer has instituted an inquiry into the relative cost of water and steam as a propelling power for machinery; and shows that even in New England, where the average cost of coal is 23 cents per bushel, that steam is cheaper than water.

If these calculations be correct, they establish a fact that adds greatly to the other advantages which the west possesses over the eastern states for manufacturing purposes.

Operatives can be fed in the west at from 25 to 50 per cent cheaper than in New England, the raw material of cotton, iron and wool, can be obtained at a less cost of freight, and if in addition to these advantages, the propelling power can be supplied at favorable locations for less than half its cost in the Eastern States, it would seem wonderful if all these advantages should long remain overlooked and neglected by a population so enterprising as that of the Mississippi Valley.

COAL MINES.

The Illinois bed, as it is termed, crosses the river at St. Louis, also, and is worked on both sides of the Mississippi:

The geographical map of the United States, compiled from surveys of D. Dale Owen and others, under direction of Congrss, and from other sources, by Lyell, and published in his travels, gives the boundaries of the following coal-fields:

The first near Richmond, Virginia, of very limited extent.

The second in Massachusetts and Rhode Island, which is not rich enough to compete with the foreign supply.

The third in the centre of Michigan, underlying perhaps one third of that State, and touching Saginaw Bay. Of this I cannot find any further description.

The fourth, or Appalachian, extends from the southern and interior

counties of New York, nearly to the southern point of the Tennessee river, in Alabama. Its western limit is near Pomeroy, on the Ohio river; it approaches to within about forty miles of Lake Erie, near Cleveland, and its point nearest the tide waters of the Atlantic, is perhaps from 90 to 100 miles west of Philadelphia.

On the eastern slope, in Pennsylvania, its character is chiefly anthracite; in Maryland, bituminous; and here are the richest mines of coal now known. Their value is inestimable, and is now fully appreciated.

Anthracite coal was first used on tide-water, as fuel, in 1820, and the supply sent to market in that year, was only 365 tons. In 1846, the total supply was 2,333,594 tons, and 11,468 vessels, exclusive of boats, were laoded with it for coastwise demand. The great and only drawback to the value of this coal-field, is its location in the mountains, and its distance from market. Over thirty-four millions of dollars have already been expended in making cannals, rail-roads, and other facilities for transporting the coal to points where it can be profitably used, and then the largest part of its cost is the result of labor outside of the mine. The interest on this capital, and the demand for this labor, will be perpetual.

On the western slope of the Alleghanies this coal field assumes a bituminous character. The only points at which it will be of value to us is where it touches the navigable waters of the Ohio and its tributaries. Here the coal is so abundant, so accessible, so cheaply and easily worked, that geologists and "coal viewers" have not been called on to describe its strata; and the only reliable authority I find in reference to it is in Silliman's *Journal* of October, 1835, and taken from a memoir of Dr. S. P. Hildreth. He gives this type of the field in the valley of the Monongahale.

"No less than four deposits of coal are found from the tops of the hills to the bed of the river, the uppermost is at an elevation of 300 feet and is six feet in thickness; the second is 150 feet above the bed of the river and seven feet thick—the coal of an excellent quality; the third is 30 feet above the river, three feet thick, and coal rather inferior; the fourth bed is a few feet beneath the river, six feet thick, and of superior quality."

This coal has some of the peculiarities of the flint-stone, a variety of the Scotch, and one of the Newcastle, but superior to either.

As this coal-field passes the head waters of the Sandy and Kentucky rivers, it takes nearly the characteristics of the pure cannel. On the banks of the river where this coal is mined, its price aside from the rent, s from 2 to 3 1-2 cents per bushel, depending on the quantity mined.

It is much to be regretted that our States interested in this field, have not had it fully surveyed and described.

There is a coal-field in the valley of the Osage river, of surprising depth and richness. This has but recently been discovered, and but little is known of it.

The great Illinois coal-field completes the list. This is nearly of an eliptical form; underlies nearly the whole of Illinois, the southwestern portion of Indiana, and the counties in Kentucky, opposite, for 70 or 80 miles. It crosses the Mississippi about the mouth of Rock river, and then extends 15 or 20 miles on the western bank of the Mississippi; its edges on the Ohio are near Fredonia, on the east, and Shawneetown on the west. Its strata are probably parallel to each other, with a rapid dip westardly, and from a few inches to 8 or 10 feet in thickness. Its area, is not much, if any, inferior to that of all the coal-fields of England. As I believe, and think I can show that this is to be *the* great manufacturing district of the world, as this city is within, and perhaps to be indefinitely enlarged by its influence, I trust that you and your readers will bear with me while I endeavor to give all the facts connected with it, and to present all its aspects for examination.

Yours, S.

RELATIVE COST OF WATER AND STEAM POWER.

Such have been the improvements, of late years, in the steam engine and in the economy of fuel, that we find steam gradually taking the place of water as a motive power. The object of the present article is to show the *present* relative cost of each. It will, however, be borne in mind, that the cost of the one is the same now and will always be the same as it was centuries ago; yet, while I write, even, the cost of the other may, by some new invention, be materially lessened. Power, for use of large manfactories, or extensive works, must be *certain* as well as ample; that of water must, therefore, be on large and rapid streams, with great volume and fall. In the West, we have but very few waterfalls where manufactories can be placed. The best, perhaps, are at Beaver, Pa., and at the Muscle Shoals in Tennessee. On the eastern slope of the Alleghanies, most of the rivers are short and are comparatively dry in summer. Many of the New England manufacturing corporations have been obliged, at vast expense, to purchase lands and form reservoirs sufficiently large to furnish water in dry seasons. The Eastern Mountains and hills are so steep that water rapidly runs from

them to the sea, and in the spring, when the snow is melting and the ice breaking up, should heavy rains fall, the force of the flood carries away every obstruction. To avoid this danger, the dams and locks must be of great strength, and necessarily, costly; while the mills, if possible, are placed off the river and take their water by canals. As the falls are falways on rocky formations and generally, at the gorges of hills, this canalage and excavation of sites for buildings and the making of roads to the spot, is attended with great expense. Where the falls are near tide-water, the work of the mills has often to be suspended.—Lowell, perhaps, is more exempt from this difficulty than Dover, New Market, Salmon Falls, and many other manufacturing sites in New England; yet Mr. Miles, in his history of Lowell, says: "Eighteen of the twenty-seven cotton mills in the city are situated on the river side, and, once or twice in each year are obliged to suspend part of their works, sometimes for days together, in consequence of back-water." Occasionally the ice carries the dam away, or breaks the water-wheel. In such cases the pay of the operatives goes on, or a higher price is put on the work of the remaining days. To estimate the loss, per diem, resulting to a company from suspension of its works, I give some of the statistics of the Merrimack mill. This mill has a capital of $2,000,000, and employs 1,737 operatives, at a cost of, say $240,000 per annum, interest on the capital $120,000—making $360,000 per annum; or nearly $1,000 per diem would be the loss by the suspension of a single day, aside from the inconvenience. Again, the water-wheels must not be exposed to the frost, but enclosed in masonry and often in excavations in the solid rock. I am not aware that any water-power in New England is cheaper than that at Lowell. This now costs $5 per spindle. At first, the Locks and Canals Company relied for its profits mainly on the advanced value of its lots and the profits on building mills and machinery for other corporations, and therefore put the price of the power at $4 per spindle—probably but little over actual cost; the purchaser being at the expense of taking the water from the canal to and away from the mill, and this has, in some instances, been very expensive.

Nearly all these water-falls are at considerable distance from the highest point of navigation, or the sea; and the estimate is within the truth when I give twenty-six miles (the distance from Lowell to Boston) as the average distance of the New England factory from the point where the cotton is landed and the depot of its goods—both of which are usually transported on the on railroads. The freight from Boston to Lowell was, and I presume now is, $3 per ton. A cotton mill of ten thousand spindles will turn out two tons of goods a day—say six

hundred tons per annum; 100 pounds of cotton will average 89 pounds of cloth; 666 tons of cotton are therefore required by the mill; 1,266 tons cost, aside from drayage, (a considerable item,) $2,532 in transportation between the mills and where the goods are sold. Aside from the extra cost of water-power, this mill would require a capital of not over $250,000—perhaps $200,000 would be sufficient. This item then is 1 or 1-4 per cent. on the capital invested. Mr. Montgomery, in his work (published in 1840,) on the comparative cost of manufacturing in England and America, says:

"The attention of manufacturers in New England has been for some time directed to the advantages of steam as a means of propelling machinery. *the advantages of a good location being considered equal to the extra expense of steam power.*"

Another important item of expense avoided, by a steam factory, is that of heating a mill. Mr. Montgomery gives the average cost of this at $467 80 per annum for a a mill of say 4 000 spindles. Six hundred dollars per annum may then be put down as the cost of heating a mill of 10,000 spindles. And it is not only necessary that the atmosphere in the mill should be at the proper degree of temperature, but of the proper dampness, so that the thread shall run smoothly. Both purposes require a large part of the fuel and machinery used in a steam mill.

The foregoing are not all, but are the most important difficulties attending the use of water power for cotton and woollen factories. Most of the difficulties are found wherever this power is applied; and as a general rule among engineers, at any position where coal can be had at ten cents a bushel, steam is as cheap as water power at its minimum cost. Such is the theory. The facts seem to go beyond this; for in New England, where water power is so abundant, the largest cotton factories, now being erected, are to have steam as a motive power; of this character are the Naumkeag mill at Salem, and that at Portsmouth; the first of 40,000 and the last of 50,000 spindles, and these are the largest in the world. At Fall River, Bristol and Newport steam factories are in successful operation. The fine goods of the Bartlett steam mills, Newburyport, have a wide reputation. The recent erection of the James mill, at the same place, shows the success of the former; and within the last year the escape steam of a new mill at Lowell is drowning the noise of the falls of the Merrimack. Let it be remembered that coal in New England costs, on an average, twenty-three cents per bushel.

As before stated, the water power at Lowell now costs $5 a spindle;

$50,000 of capital is to be invested in power to run a mill of 10,000 spindles.

The interest on this, per annum, is - - - - -	$3,000
Now add the cost of heating the mill. - - - - -	600
And the cost of transportation, - - - - - -	2,532
And you have one side of the question as against steam,	$6,132

I cannot fix, with precise accuracy, the steam power and fuel required for a mill of 10,000 spindles. The only authority before me, gives this estimate for one of 3,7000 spidles, with the necessary machinery for preparing the cotton and manufacturing the cloth: A high pressure engine of 40 horse power—length of stroke 4 feet, diameter of cylinder 1 foot—makes 40 single or 20 double strokes per minute; these or four round boilers, 15 feet long by 2 1-2 feet in diameter, requiring 200 gallons of water, and consuming 1 1-4 chaldrons (45 bushels) of bituminous coal per day—pressure of steam sixty-eight pounds to the square inch. To do double the work does not, as I am told, require double the power and nothing like double the fuel. This estimate was made eight or nine years since; within that time very important improvements have been made in the application of steam power and the use of fuel; and probably I may safely say that an engine of 90 horse power, requiring 80 bushels of coal, is sufficient for the mill of 10,000 spindles.

Then 80 bushels of coal for 300 days at 23 cents per bushel,	$5,520 00
Add salary of engineer,	500 00
	$6,020 00

Showing an advantage in favor of steam, *from coal at twenty-three cents a bushel*, of $112 per annum. The cost of an engine of 90 horse power, boilers, belting, pipes, &c., not required for the purposes specified in the other, would be probably not over $9,000, while the cost of communicating the water power to the machinery would be at least 17,000, Montgomery, in the work already quoted from, states the cost of two water wheels, equal to eighty horse power, including gearing, gates, shafting, belting, &c., at $17,000, The Tremont and Suffolk mills at Lowell contains 12,000 spindles, make coarse goods, and have six water wheels; the cost of each wheel between $3,000 and $3,500. entirely exclusive of the cost of excavating and walling up the branch canals to and from the mills.

It is a mooted question which will last the longer, the wheels or the engine; but give $3,000 to equal the difference, and there is the interest of $5,000 to add to the advantage before stated.

In a future paper I may give additional facts connected with this subject. My purpose is to show that New England cannot retain her monopoly of manufactures, and that, in cheapness of coal, this valley of the Ohio, possesses advantages for manufacturing over any other country.

Yours, &c., S.

October, 16, 1847.

ARTICLE VI.

Manufacture of Iron in St. Louis, Iron Mountain, and Iron Ore in Missouri,—Causes hindering the production of Iron in Missouri. Brass Foundries. House and Blacksmithing.

In noticing the manufacture and consumption of Iron in St. Louis, we are naturally led to submit a few reflections upon the subject of the mineral resources of Missouri; and to suggest what appears to us the cause of their having been so long neglected.

The Iron Mountain and Pilot Knob are among the most remarkable mineral curiosities of the world; and are supposed by many to contain a sufficient quantity of ore to supply the State with Iron for centuries. But it is not in the abundance merely, that the value of this article consists; for in respect to quality, it is believed to excel any other Iron produced on the continent; and, in addition to its adaptation to ordinary purposes, the Steel produced from it is susceptible of being wrought into articles of fine cuttlery. We have recently seen a penknife made of this artic̈icle at Sheffield, England, which, in appearance, is equal to any thing of the kind that has ever come under our observation.

But, notwithstanding the abundance and the excellence of the Iron Ore in this and in other parts of the State, yet, the States of Missouri, Illinois, Iowa, and the western part of Wisconsin, are almost entirely supplied with Iron from abroad.

We have frequently inquired why the people of Missouri do not produce Iron sufficient to supply their own wants? To these inquiries we have been answered by some, that, it is owing to a want of capital; others have supposed that the country was too new, and that owing to the difficulty of procuring labor, skill and other necessary facilities, Missouri could not successfully compete with Pennsylvania and other

States in the production of this important article. That difficulties must be encountered in the commencement of the business, there can be no question; and the causes assigned have no doubt tended to hinder the progress of this branch of industry. But there is a cause more remote and yet more potent than all these, which tends not only to retard the production of Iron, but to discourage the introduction of manufactures, and the mechanic arts throughout the West. We allude to the overwhelming influence which commerce exerts over the capital and enterprise of the American people. We fully appreciate the importance of commerce, not only as an agent of the producer, but as a great social agent also; yet, as it originates from those necessities which arise from difference of climate, and the peculiar distribution of the soil, minerals, and other natural products of the earth, it is the true policy of the people of every country to limit, as far as practicable, this foreign commerce to the exchange of these natural products; and to apply their labor and capital to the development of the natural resources of the region which they inhabit.

What should we think of the intelligence of a people, who possessing an abundance of iron ore, with all the material necessary for its manufacture, should, nevertheless, raise grain and transport it a distance of from one to five thousand miles, to feed the producers of Iron; and receiving this article in exchange for their grain, bring it home to be used in the implements of husbandry. If not in fact, Missouri has in effect, been engaged in carrying on this operation, from the time of its earliest settlement until the present. We smile at the stupidity of the man, who, when going to mill, puts a stone in one end of the bag to balance the grain in the other; how far the people of Missouri have advanced beyond this practical idea, we shalll leave for the discussion of the curious.

The capital and labor employed in exchanging our products for the products of other countries, at so great a distance, leaves little in the hands of the producers to be applied to other purposes; and the attractions of commerce drawing to it the enterprize, as well as the capital of the country—the developement of its natural resources are consequently neglected. It would be unnatural for those engaged in commerce, or, in the carrying trade, to promote the production of Iron in Missouri; for this would limit their field of operation; and hence the commercial interest, at least, in the West, is in effect, opposed not only to the production of Iron, but also to the introduction of manufactures. We have little to expect from the mere capitalist, for, ever selfish and timid, he rarely embarks in any enterprise with an eye to the social good; but looks rather to the security of his own interest, by lending upon bond and mortgage. These, we esteem the true causes which

prevent the developement of our natural resources, and which retard the introduction of manufactures in Missouri, depriving much of its population of profitable employment—and the producers of remunerating prices for their products.

We intend, if practicable, to collect and lay before our readers, at an early day, a full account of the Iron of every description, received and distributed at this place; so as to enable the people of this State, to form an opinion in regard to the immense importance of working their own raw material.

From the best information yet obtained, we learn that about 5,000 tons of pig metal was used in the foundries of St. Louis in the year 1847: and that about 3,000 tons was distributed at this point and shipped up the Illinois, Mississippi and Missouri Rivers. The amount of bar and other wrought iron will be noticed hereafter.

The following is a list of Foundries in St. Louis, showing the number of hands employed, and the amount of metal used at each for the year 1847.

Name of Foundry.	*Name of Owner.*	*No. of hands.*	*Am't of Metal used.*
Mississippi, -	Gaty, McCum & Glasbey,	120	800 tons.
Broadway, -	Kingsland & Lightner,	130	800 "
Phœnix, -	Kingsland & Ferguson,	50	500 "
Egle, - -	Garison & Brother,	60	400 "
Union, -	Bridge & Brother,	50	1000 "
Franklin, -	Garrison,	15	150 "
	Fairbridge,	12	200 "
Washington, -	J. T. Doudle & Co.	50	400 "
	Smith & Co.,	20	200 "
City, -	Little & Sherwood,	20	150 "
Etna, -	Boyd,	15	80 "
11 Establishments.		537	4,680

There are one or more small establishments in this city which are not included in the above statement. There are also several Brass Foundries in the city; but we have not been able to procure correct information as to the amount of work done at them; from the best information, however, it is believed that about sixty tons of copper are consumed annually at these establishments.

No branch of business, perhaps, in the city, has increased so rapidly within the last two or three years, as that of the manufacture of Iron.

Besides the business of casting, we have a large number of smithing establishments, upon quite an extensive scale. Among these may be mentioned that of Messrs. McMurray & Dorman, who work about

twenty-five hands; and use about one hundred and twenty-five tons of bar and sheet iron per annum. C. & T. R. Pullis work about ten hands, and use about one hundred tons of bar and sheet iron. A large portion of the work done at these establishments, consists of iron railing Bank and Vault doors, Fire-Proof Safes, and other heavy articles.

There is scarcely an article of cast or wrought Iron which is required for the use of the country, that cannot be made of as good quality at St. Louis as in any of the Eastern States; and St. Louis bids fair in time to rival if not surpass, any other city West of the Alleghany Mountains in this branch of industry.

ARTICLE VII.

The Moral Uses of Plants

The pleasurable emotions derived from fruits and flowers induce to moral action—Their impressions upon the mind of childhood—May be used for educational purposes—The effects of the association of a refined taste with labor, a source of pleasure and profit—Their uses as symbols and memorials—The living language of all nations from the earliest ages—Their tendency to strengthen and perpetuate parental and fraternal affections.

Having noticed in a preceding article the habits and economy of plants, and also some of their more prominent physical uses, we shall, according to our original design, proceed to consider the influence which they are calculated to exert upon the moral character of man.

In considering this branch of the subject, we shall only aim to note some of the more prominent and obvious phenomena, for the purpose of exciting an interest in the mind of the reader, and of calling his attention to one of the most pleasing and instructive branches of natural economy. When we carelessly look abroad upon the world of matter, we do not readily perceive its moral uses; but if we examine it more attentively, we shall discover a moral as well as a physical use in almost every object which presents itself to our senses. This is especially the case in regard to those things which are more immediately connected with the support of our existence.

By this wonderful combination of the moral with the physical uses of matter, we have always present to our

waking senses, objects inviting us to the enjoyment of moral and intellectual pleasures. These address themselves to the eye, in all the varieties of color, of form, and of magnitude; to the ear, in every variety of sound, from the whispering of the zephyr to the deep-toned thunder; to the senses of taste and smell, with flavors and odors infinite; and with soft and varied blandishments, they woo us to contemplate the boundless mysteries of nature, and to adore its author.

The vegetable kingdom is the proximate link which connects man with the universe, and is the immediate source whence he derives the means of existence. Many agents, all operating within their respective spheres, and all converging to one point, combine and concentrate their powers and properties to produce plants for the use of the animal kingdom. The combinations and chemical changes of inorganic matter; light and heat; the condensation and evaporation of fluids; all the machinery of clouds and atmospheric currents, influenced and controlled by the invisible and subtle, yet powerful spirit of electricity, have reference to this result. By the combination of these agents and properties, was produced the first form of organic matter: here was presented the first phenomana of the vital principle, and hence it has been transmitted to the animal kingdom: and when we contemplate the perfect adaptation of plants to the physical and moral condition of man, we are ready to conclude that there is perhaps as much philosophy as poetry in the idea, that they are a part of our nature, and that we sympathise with their existence. Like man, plants are endowed with both a selfish and a social nature: every organ and faculty performs some function connected with their individual economy, all tending to the one great purpose of perpetuating their species, while physical properties, acting upon their condition, supply the place of instincts. From the organic constituents of plants, man derives both food and raiment, and these constitute their principal physical uses; but they possess many properties which do not appear to perform any useful purpose in their individual economy, nor do they seem to be necessary to the existence of man: these were doubtless

imparted to them for the purpose of delighting our senses, to the end that we might not only eat and live, but that our hearts might also be filled with love and gratitude to the Creator for his benevolence. These properties must, therefore, be considered *moral*, and consist principally of flavor, odor, color and form. While these delight and gratify our senses, they excite a desire to impart the same gratification to others: this is a feeling which every individual must have experienced, and establishes the connection of a moral with the physical uses of plants.

But of all the properties of plants, those of color and form are the most purely moral, and make the strongest impression upon the mind: the varied and delicate colors and forms of plants, of flowers, and of fruit, excite emotions of *beauty*: that

> "Source of all delight
> That kindles in each human breast
> Love, and the wish of poets, when their tongue
> Would teach to other bosoms what so charms
> Their own."

The emotions of beauty are so identified with our moral emotions, that they invariably give rise to a desire of imparting them to others, that *they* may experience the same pleasing delight, and sympathise in our pleasures. Where is the heart so selfish, and so void of sympathy, that it does not feel a desire to exhibit to others those objects which excite emotions of beauty in itself? Here, then, is one great source of moral and social action, flowing from the vegetable kingdom, and moving our hearts to acts of benevolence; and although the benefits may appear trivial, and be esteemed as of little worth by men of grosser minds, yet are these benefits diffused throughout the moral world, and although unperceived, enure to those who affect to despise them.

These moral properties of plants are so varied and abundant, that they are available to the whole human family; and the pleasures which they impart may be enjoyed by an indefinite number of individuals without in any way impairing their qualities: and they decay none the sooner from having thus contributed to our delight. In this respect they afford a happy illustration of the attribute of Divine Love which ever flows on without di-

minishing the fountain whence it issues. But like every other gift of nature, man is required to qualify himself for its enjoyment by cultivating his taste. If we disregard these moral properties, and should look upon the vegetable kingdom as the source whence we derive our physical support merely; those vivid emotions of beauty which we experienced in childhood, will cease to arise from the exhibition of these interesting objects, and we shall be deprived of one of the most refined sources of pleasure which has been designed by a kind Providence for our enjoyment.

When we contemplate this boundless source of pleasure which is common to all; the ordinary accidents of wealth and poverty lose their importance, and we should pity the individual who would exchange a refined and cultivated taste for flowers and plants for all the wealth which could be acquired by a life of labour and anxiety. The cultivation of such a taste however, would in no wise lessen the profits of labour; so far from doing so, it would be the means of improving our knowledge of the health and economy of plants, and enlighten our minds in regard to their culture; we therefore reap a two-fold harvest, the one of profit the other of pleasure.

The bright colors and beautiful forms of flowers and fruits are among the earliest objects which attract the attention of the infant mind. This is an important fact and deserves to be noted by the philosopher for the purpose of discovering its meaning; it would be little less than Atheism to conclude that a phenomenon so universally observed, should happen without a benevolent design, and from the universality and vividness of the emotions which children evince from the exhibition of color and form to their observation, we conclude that these emotions were designed for important purposes.

Then what are those purposes? We answer, these flowers and forms are designed as the pictures, and embellishments of the title page to the Book of nature, to excite the mind to study the subject; and they plainly indicate that the vegetable kingdom is the first lesson in the book of human knowledge. Here the design of

the author is more obvious, and the illustrations more simple and practical than in any other part of Nature's works.

The infant mind is inquisitive and curious to know the cause of every thing which attracts its attention and is quite capable of understanding at an early age most of the important principles connected with plants as well their various uses.

We have learned to embellish the first books for children with pictures, for the purpose of interesting them on the subject which we desire to teach them; and also, for purposes of illustration: in this we have followed nature, but we have neglected to use the more interesting, and instructive symbols which she has designed as incentives to the young student in her own works.

Were children instructed in the economy and habits of plants, and were their minds enlightened in regard to their uses, and the intimate relations which they sustain to the human family, it would open to their minds a source of knowledge which could not fail to exert a most important and salutary influence upon their moral character. Such knowledge would give them a just idea of their physical and moral relations, and enable them to appreciate the necessity of physical employment, it would be the best field for intellectual exercise and improvement and unite the dignity, and refinement of science, with the exercise of labor, and harmonize the physical with their moral natures.

How different from such a condition is that of him who, without such knowledge, and who with taste uncultivated, and blind to the operation of the laws of nature, is driven by necessity, or perhaps by parental command not less stern, to labor for the means of existence. Thus cast from the Eden of his childhood—uninstructed in all which could impart pleasure to his employment—he goes forth with the curse of ignorance upon his head, to eat of the herb of the field as doth the ox; and in the sweat of his face to dig for his bread. Such an one can find no pleasure in his employment. His heart is void of gratitude; all his aims are selfish, and tend to a state of moral degradation.

We invite those whose duty it is to give direction to the infant mind, to observe the delight which it takes in the colors and forms of flowers and fruits, that they may avail themselves of these early emotions for the purpose of giving tone to its moral character. If this season is permitted to pass without improvement, these objects will lose their interest, and give place to others less refined and less instructive; and having once departed from nature's pure fountain, where the gushing waters first meet the light, he can never return; and let him thirst as he may, he must ever after drink from the stream below, mingled with the impurities through which it has flowed.

The cultivation of flowers and plants from motives of taste and moral improvement, is the most refined of all the arts; and while it affords bodily exercise and health, it restrains the mind from vicious tendencies, and is calculated to impart a moral tone not less pure than the germ of the unblown flower. And although the most social of all pursuits, it is perhaps the best corrective of that heartless and demoralizing state of society which consists of personal associations without sympathy; of forms without affection; and of professions without sincerity;—where all have studied and practiced deception, until the vices of each are known, and falsehood can no longer conceal depravity.

There are, however, other uses, which plants possess, still more refined, and more purely moral, than those which we have noticed. We allude to their uses as symbols and memorials, in which they supply the place of articulate sounds and written records. These uses have doubtless been understood and appreciated from the earliest ages; and flowers or plants, when happily used as symbols, speak a language and convey a meaning, which are understood by all nations, and are in no danger of being perverted by translation. It is the living language of all mankind, and produces the same emotions, and imparts the same ideas now, that it did three thousand years ago. Solomon, the wise man of Israel, spoke of trees, from the Cedar tree that is in Lebanon, even unto the Hyssop that springeth out of the wall; and he wove into song the Rose of Sharon and the Lilly of the Valley;

using these beautiful emblems—the one of love, and the other of purity—to symbolize the Christian Church. Since the days of Solomon, many languages have decayed, and all have suffered corruption; but the Rose of Sharon and the Lilly of the Valley, remain the same bright emblems of love and purity, as when they first unfolded their petals in the garden of Eden; and thus shall they remain until the end of time. And as each returning season shall display their bright colors, and as often as man shall pause to contemplate their beauty, he shall be reminded of the pure and universal love of the creator and author of his being.

Flowers and plants are among the things of our earliest observation, and are intimately associated with our first emotions of love, of joy, and of gratitude. The vivid emotions produced in the mind of the child by the bright colors and forms of flowers and fruits, as also by their grateful odor and flavor, are mingled with its filial affection, and become so blended that they ever remain united and inseparable. Therefore, the flowers which bloom, and the fruit which ripens around us each returning season, throughout our pilgrimage, remind us of a parent's love, the affectionate admonition, and of the fervent supplication, that we might be delivered from evil. Where else shall we find moral restraint so potent, or counsels so pure and disinterested?

The ardent passions of youth, or the absorbing pursuits of manhood, may perhaps for a time prevail, and repress these influences; and the flowers may fade, the fruit decay, and their forms perish, yet each returning season shall restore them in all their primal freshness, bearing in this, their renewed state of existence, the same faithful records which were first engraved upon their predecessors. And when the ardor of youth, and the fierce struggle of manhood, shall have yielded to the calm philosophy of riper years, wearied with vain pursuits, and, haply, with a conscience not quite at ease, the man shall turn aside to seek these emblems, and purify his heart, and revive his affections, by refreshing his mind with early associations;—then may he remember how oft in the days of his wanderings, when, beguiled by his passions,

or lured by thirst of gain, or perhaps goaded on by ambition, these silent yet eloquent monitors have met him in the way; and, forwarned by their admonitions, he paused in the pursuit, and turning aside, escaped from evil.

Then cultivate plants and flowers as family records—as memorials of affection. They shall impress upon thy heart and thy affections their own purity, and serve as a talisman to protect thee from error; and, associated with thy parental virtues in the memory of thy children, they shall ever speak of thee and of thy counsels.

The fraternal and social affections, nurtured and developed in the midst of plants and flowers, shall also be perpetuated by these memorials. The first flowers of spring shall call their spirits from every land where fortune may have led them, and, meeting again in the garden and groves of their early home, they shall renew the pure affections of childhood; and hearts, it may be, that have wandered from virtue, or perhaps have been crushed by disappointment and affliction, shall return,—*those* purified and refined from their errors; and *these* with hopes renewed;—*all* shall be refreshed, and shall gird themselves with higher resolves and firmer hopes to overcome the perils which await them.

ARTICLE VIII.

Boat Building at St. Louis.

Situated as St. Louis is, in the very heart of this great valley, and on the bank of its largest river, and below the confluence of the Missouri and Illinois rivers, thus commanding the entire trade of a country teeming with agricultural richness, and mineral wealth, she must necessarily ultimately become one of the largest Manufacturing and Commercial marts on the American Continent. Most of the products concentrating here now, and for years to come, must consist of the raw material, such as Corn, Wheat, Tobacco, Cotton, Sugar, Molasses, Lead, Iron, &c., &c., articles generally heavy and bulky. Hence the carrying trade must continue to increase, to an extent almost inconceivable,

as the resources of the country are developed, and steamboats and steamboat building must rank among the great interests of the West. Many of our citizens are now steamboat owners, and a vast amount of capital is invested in that particular branch of business. Hitherto, many of them have sent abroad to have their boats constructed, by which an immense amount of capital has been annually drawn from the business channels of St. Louis, which might have been employed, if not more profitably to the capitalist, certainly more beneficially to the community, to the same purpose here, while it would have promoted St. Louis industry and prosperity. Is it not time that this economy of home industry should be properly understood, and if possible, a radical change effected?

From the best information we can get, we find that all the essential materials for building, can be had here in very great abundance, and that our St. Louis mechanics can and do construct as good and fast running boats as can be built at any other point in the West, or elsewhere. It is only necessary, therefore, that these facts should be generally known and appreciated, to save an immense amount of capital annually to this part of the West.

It is with a view of calling attention to, and encouraging, this important branch of mechanism to St. Louis, that we present the following sketch of the entire number and tonnage of Steamboats built at this point.

The following list, up to the first January last, we take from the St. Louis *Union:*

"Among the earliest boats built at this point were the *North St. Louis* and *Little Eagle*, by GLENN. These were small boats, and we have no means, at this time, of ascertaining their tonnage or cost. They were built in 1838 and '39.

The *Chicago* was about the next. She measured 150 tons, and was built by Case. She is now running on the Arkansas river.

The *Charlotte*, 250 tons, was soon after built by Case. She has been lately repaired at Pittsburgh, and is believed to be running on the Ohio river.

The *Potosi*, 120 tons, was built by Case, in 1842. She has lately been torn up, and her machinery put into the *Cora*, built in the Upper Mississippi, and finished at this port. The Cora measures 144 tons, and cost about $11,000. Like the boat just named, some of the boats named below, were built elsewhere, but brought to this port to receive their machinery and finish.

The *Inda* was built in 1842. She measures 360 tons, and is still running.

The *Henry Bry* was built by Emerson, 1842 or '3. She measured 350 tons, and cost about $17,000. She took on the machinery of the *Leavenworth*. The *Bry* was sunk in the Lower Mississippi about eighteen months ago.

The *St. Louis Oak*, built by Coonse, in 1842, measures about 100 tons, and cost about $14,000. She is yet running.

The *Monona* was built by Hathaway in 1843, She measures 175 tons, and cost about $15,000.

The *Luella*, built by Murray, in 1843. She measures about 150 tons, and cost about $12,000. She is an excellent boat, and quite celebrated as a fast packet, plying daily between St. Louis and Alton.

Tne *Nimrod* was built by Emerson, in 1844. Her tonnage is 260 tons, and her cost was $14,000. She has recently been purchased by a New Orleans firm, to run in the lower country trade.

The *Reveille*, a boat of 45 tons, was built in 1844—by whom and at what cost, not ascertained.

The *St. Croix*, 150 tons, was built by Murray, in 1844. Her cost was about $15,000.

The *Die Vernon* was built by Emerson, in 1844. She measures 212 tons, and cost $16,000.

The *Laclede*, a favo rite packet boat, was built by Emerson, in 1845 She measures 240 tons, and cost $18,000.

The *Little Dove* was built by Emerson, in 1845. She measures about 75 tons—cost not known.

The *Dial* was built in 1845. Her tonnage is 160. Other particulars not known,

The *Iowa* was also built in 1845. Tonnage 250. Cost, &c., not ascertained.

The *Governor Briggs*, tonnage 120, was built by Clark, in 1845, and at the cost of $9,000

The *Helen* was built in 1845. Tonnage 60. Further particulars. not ascertained.

The *Prairie Bird*, tonnage 215, was built by Emerson in 1845. Cost $16,000.

The *Convoy* was built at Big Muddy, in 1845, and finished at this point in 1846. Her tonnage is 750 tons, and she measures on deck about 300 feet.

The *Missouri*, another leviathan, was finished at this port in 1845. Her tonnage is 886 tons, and her length on deck about 300 feet.

The *Tempest* was bnilt by Emerson, in 1846. she measures 211 tons, and cost $17,000.

The *Ocean Wave* was also built by Emerson, in 1846. Measurement 200 tons, and cost $16,000.

The *Saluda* was built at one of the Ohio boat yards, in 1846, and brought here to be finished. She measures 233 tons.

The *Alvarado* was built by Emerson, in 1846, Tonnage 134 tons, and cost $12,000.

The *Bon Accord* was built by Brooks & Co., in 1846. Measures 150 tons, and cost about $14,000.

The *Amelia*, 150 tons, was built in 1846 by Emerson. Cost $12,000.

The *St. Joseph*, 220 tons, was built by Burns in 1845, at a cost of some $16,000.

The *Tamerlane*, 125 tons, was built by Miller, in 1846. Cost about $12,000

The *Laurel*, about 80 tons, was built in 1846. Particulars of cost, &c., not known.

The *Amaranth*, 330 tons, was built in 1846 by Emerson. Cost, $18,000

The *Hannibal*, tonnage, 464 tons, was built at Elizabeth, Pa., and finished here in 1844.

The *Old Missouri* was lengthened here at the cost of about $8,000.

The *Algoma*, 200 tons, was built in 1846 at Cincinnati, and finished here.

The *Mound City* was also finished at this port some four years ago.

Besides the above enumerated boats, some four or five ferry boats have been built at this point, and from 15 to 20 barges and keels, at an average cost of $8,000 each.

At this time, three fine boats are on the stocks, two at the yard of Mr. Emerson, and one at that of Brooks & Co. Capt. Geo, Taylor's boat, at Emerson's, will measure 600 tons, and carry one thousand. Her keel measures 250 feet, and deck about 300. She had 34 feet beam, and 7 feet hold. She receives the machinery of the *Brilliant*, now being torn up. Her probable cost will be $35,000. At the same yard is Capt. Beer's new boat. This measures 150 feet keel, and 165 on deck. Beam 27 feet, hold five feet. She will have two engines, and two 28 feet boilers, 40 inches in diameter. 18 inch cylenders with six feet stroke. She measures 213 tons, and will carry 300. Prob able cost, $14,000.

At the yard of Brooks & Co., is the *Keokuk Paacket*. She measures about 300 tons, and will probably cost $19,000.

The following shows the number of Steamboats, by whom built, and the amount of tonnage to each boat, during the year 1847, which, taken in connection with the above, shows the entire number built, with the amount of tonnage, at St. Louis, from time the first boat was erected:

The *Mandan*, 204 tons, built by Primus Emerson.

The *Martha*, 180 tons, hull built at Cincinnati; engine and cabin built here.

The *Lake of the Woods*, 86 tons.

St. Paul, 358 tons, built by Brooks, Meagan & Holiday.

St. Petters, 163 tons, built by Brooks, Megan & Holaday.

Piazza, 86 tons.

Kate Kearney, 304 tons, built by Clark & King.

The *Montauk*, 175 tons.

Beardstown, 77 tons, built by Ely Sly.

Gov. Bent, 190 tons, built by Clark & King

The *Illinois*, 579 tons, built by Primus Emerson.

The *Autocrat*, 846 tons, do do

Eliza Stewart, 169 tons, do do

Lucy Bertram, 148 tons, built by Clark & King.

The *Kansas*, 276 tons, do do

The following shows the number of boats built at other points in the West, by citizens of St. Louis, for the St. Louis trade, for the year 1847:

The *Wyandot*, 314 tons; the *Dubuque*, 168 tons; the *Time and Tide*, 161 tons; the *Meteor*, 162 tons; the *Rowena*, 230 tons; the *Alexander Hamilton*, 212 tons; the *Alton*, 344 tons; the *Eudora*, 420 tons; the *Mary*, 276 tons.

Note—There are a number of Steamboats now on the stocks at the different yards, not yet finished.

ARTICLE IX.

Remarkable Events and Occurrences.

Under this head, at the end of each number of our Journal, we shall notice such events and occurrences, as may seem worthy of remembrance, and at the conclusion of each Volume, these will be placed in the Index. To those who take, and preserve, the "Western Journal," this will, in time, constitute a valuable register of the prominent events of the country.

Magnetic Telegraph.—Communication beetween St. Louis and the Eastern Cities.

We are pleased to be able, in the first number of our Journal, to announce the Telegraphic connection between St. Louis and the Eastern Cities.

The first communication, from Illinois Town, on the opposite side of the river, was made, on the 20th ultimo. Captain H. M. SHREEVE sent the first message.

Great flood in the Ohio river, about the 15th ultimo. the river at Cincinnati was reported to have risen about 60 fet above low water mark—lacking but a few feet of being as high es the great flood of 1832.

No. 1.

Lumber, Shingles, Lath, Wood, &c.----Amount of Lumber Sawed at St. Louis.

By reference to the following statistics, it will be seen, that the lumber and wood trade at St. Louis are becoming matters of much importance—branches of business that may well receive some attention.

The reports of the Lumber and Wood Master, for the last three years, show the following receipts at the wharf:

	1847.	1846.	1845.
Lumber, feet,	15,035,391	13,169,332	10,389,382
Shingles, M.,	11,983,700	10,652,900	13,927,500
Laths, "	2 475,300	1,807,780	2,328 700
Cooper Stuff,	1,262,652	966,963	441,770
Cords of Wood,	28,028	29,476	22,646
Rafts arriving,	95		
Posts,	7,000	6,997	5,263

From the best information we can get, the amount of Lumber sawed at the different Mills at St. Louis, is about 15,000,000 feet per annum, which added to that measured at the wharf, shows the amount of lumber, consumed per year, at St. Louis, to be over 30,000,000 of feet; this will give some idea of the growth of St. Louis.

No. 2.

Specie and Bullion in the United States.

The New York Journal of Commerce gives a table showing the amount of specie and bullion imported into the United States, (through the Custom House,) and exported from the United States, 1821 to 1846, inclusive; the sum total being as follows:

Imports, - - - - - - - -	$221,684,605
Exports, - - - - - - - -	$162,425,779
Balance, - - - - - - - -	$59,458,826

"The returns (says the Journal) for the year ending June 30, 1847, are not yet made up, but it is known that the imports of specie were very heavy, and the exports very light. There must have been a considerable exportation of coin from New Orleans for the use of our army in Mexico. From the returns at New York, Boston and New Orleans, and other datas, we should judge that from the 30th June, 1846, to the 1st of the present month, the imports of specie into the United States, through the Custom House, were at least twenty millions over and above the exports. Since the first inst., and for a short time previous, the current has been running the other way, though not very strongly.

AMOUNT OF SPECIE IN THE COUNTRY.

It has been estimated that the amount of specie in the country on the 30th September, 1820, was - - - - -	$20,000,900
Imported since, to June 30, '46, as above. - -	241,634,578
	$241,684,578
Deduct exported to same date, as above - - -	162 425,779
Leaving on hand 30th of June, 1846 - - -	$79,258,799
Estimated net addition from 30th June, 1846, to 1st instant	20,000,000
Leaving on hand 1st instant - - -	$99,558,799

Or say in round numbers, $100,000 000. That the amount exceeds this, rather than falls below it, we fully believe. For if large numbers are constantly melted up for plate and jewelry, so on the other hand a

vast aggregate is imported by emigrants, which does not pass through the Custom House, and of course is not included in the returns. The amount so imported is believed to exceed $5,000,000 per annum on an average of the last ten years; and this year, owing to the vast increase of emigration, and the further fact that a larger portion of the emigrants than usual possess some property, we estimate the amount of specie which they bring at $10,000,00. This would be about $40 each, on an average.

The amount of specie in the country on the 30th of September, 1841, according to a calculation made by the then Register of the Treasury, was $63,503,898. The increase since is $40,000,000 or upwards.

The following shows the amount of Gold and Silver Coinage of the United States Mints:

	Charlotte, N. C.	Dahlonega, Ga.	N. Orleans.	Philadelphia.	Total.
1793 to 1837	- - -	- - -	- - -	72,085,530	72,085,530
1838 " 1841	507,025	517,990	1,850 693	10,429,664	72,085,530
1842 - - - -	184,508	309,647	1,295,750	2,426,851	4,190,764
1843 - - - -	272,064	670,000	4,568,000	6,530,043	11,940,187
1844 - - - -	146,210	488,600	4,208,500	2,843,457	7,687,767
1845 - - - -	- - - -	501,795	1,750,000	3,416,800	5,667,595
1846 - - - -	76,665	449,727	2,483,800	3,623,443	6,633,965
Total, - -	1,177,772	2,057,839	16,165,743	101,355,288	120,931,170

No. 3.

The Manufacture of Flour at St. Louis.

The following table will show what St. Louis is doing in the business of Flour Manufacturing.

We have made up our table from the facts obtained from the several establishments. The amonnt was not, perhaps, in any case, given with perfect accuracy, but were nevertheless designed to approximate as near to the truth as practicable without a minute investigation into the Books of the several concerns.

The commendable enterprise, and good judgement of the St. Louis Millers have established a reputation for the flour manufactured here which gives it an advantage of from 10 to 15 per cent. over the brands of any other part of the Mississippi Valley.

The number of Mills and the enterprise of their owners not only create competition, but are calculated to give a steadiness to the wheat market, which could not exist were the producers entirely dependent upon those who are purchasers for foreign markets.

If there existed competition here from the like cause for all our great staples it would place the prosperity of the West upon a more permanent basis, and thus protect the producers from the revulsions which frequently occur in prices.

A Table showing the number of Mills—Number and size of Stones, and quantity of Flour produced in St. Louis, in the year 1847.

Name of Mill.	*No. of Run of Stone.*	*Size of Stone.*	*No. of bls. of Flour.*
Page's Mill, -	8	Av'ge 4 1-2 ft.	70,000
Missouri Mill, -	3	" 4 1-2 "	30,000
Star Mill, -	3	" 5 "	26,000
Union Mill, -	3	" 5 "	24,000
Eagle Mill, -	2	" 4 ft 9 in.	24,000
Park Mill, -	2	" 4 " 6 "	24,000
Brick Mill, -	2	" 4 " 6 "	20,000
Washington Mill,	2	" 4 "	24,000
Franklin Mill,	4	" 3 "	16,000
Phœnix Mill, -	4	" 4 "	30,000
Nonantum Mill, -	2	" 4 " 6 "	30,000
Centre Mill,			16,000
Chouteau's Mill, -	3	" 5 "	11,000
Paragon Mill, -			6,000
Mound Mill, -			14,000
Total number of barrels of Flour, - -			365,000

There are now being built two other mills in the city calculated for two run of stone each.

We give the above facts as we get them from either the owners or agents on the premises, and doubt not that the information approximates sufficiently near to the truth for all the purposes designed by our table.

No. 4.

Number of Steamboat arrivals each month at St. Louis,—Amount of Tonnage,—Also, the number of Keels and Flats.

In order to give some idea, of the number of Steamboat arrivals and amount of tonnage, at different seasons of the year at the port of St. Louis, we give the following table, showing the number of arrivals each month, which will enable our readers to form an opinion as to what period of the year the heaviest portion of the commerce of St. Louis is carried on.

ARRIVED, 1846.				ARRIVED, 1847.			
	No. of S. Boats.	Tonnage.	Keels & Flats		No. of S. Boats.	Tonnage.	Keels & Flats.
January,	50	8.917	6	January,	64	12.3ff2	27
February,	152	26.111	35	February,	67	19.550	24
March.	158	31.850	22	March,	231	48.804	81
April,	158	49.334	44	April, Msy,	119	181.536	192
May,	162	78.124	68	June,	245	56.537	30
June,	195	64.043	38	July,	351	75.085	26
July,	193	46.554	68	August,	238	42.408	74
August,	211	37.553	75	September,	242	41.229	20
September,	171	28.331	72	October,	341	56.038	35
October,	237	37.558	162	November,	297	46.781	60
November,	185	31.346	171	December,			
December.	190	32.393	120				
	2412	577.824	881		2995	558.186	558

*The month of December of course is not included in 1847.

No. 5.

To Prevent Wood Decaying.

Take 12 ounces of rosin, and eight ounces of brimstone, each coarsely powdered, and three gallons of train oil.—Heat them slowly, gradually adding four ounces of Bees-wax, cut in small bits. Frequently stir the liquor, which as soon as the solid ingredients are dissolved, will be fit for use. What remains unused will become hard on cooling, and may be remelted on subsequent occasions. When it is fit for use, add as much Spanish brown, or red or yellow

ochre, or any color you want, first ground fine in some of the oil, as will give the shade you want; then lay it on as hot and thick as you can with a brush; some days after the first coat is dried, give it a second. It will preserve plank for ages, and keep the weather from driving through brick work. Common white paint may be used on top of it, if required, for the sake of appearance. Two coats should always be given, and in compound machinery the separate parts should be varnished before they are put together, after which it will be prudent to give a third coating to the joints or to any other part which is peculiarly exposed to moisture, such as water- shoots, flood-gates, the beds of carts, the tops of posts, and all the timber which is near or within the ground. Each coat should be dry before the parts are joined, or the last coat applied. The composition should be applied when the wood is perfectly dry. It is necessary that compositions made of hot oil, should for the sake of security, be heated in metalic vessels, in the open air; for when the oil is brought to a boiling point, or Farenheit, the vapor catches fire, and though a lower temperature should be used in this process, it is not always possible to regulate the heat or to prevent the overflowing of the materials, in either of which cases, were the melting performed in a house, fatal accidents might happen.—*Archives of Useful Knowledge.*

No. 6.

Agricultural Chemistry.

Agricultural Chemistry teaches us that there are essential ingredients in soils, which it is of the highest importance we should understand. It is incontrovertible that the salts existing in soils constitute but a very small portion of the whole mass of the soil—that they are not to be deemed accidental, but entirely indispensable to plants, which according to their respective nature admit one or another into their circulation, and perishing for want of the appropriate salt. By salts we must understand all those substances which consist of a base united with an acid. The principal bases are Potassa, Soda,

Lime, and Magnesia, which enter into the composition of all fertile soils. The acids with which these ordinarily combine are the Carbonic, the Sulphuric and Phosphoric. By burning plants, their combinations appear in ashes. An examination of the properties of their principal salts and their components, sheds a great light upon the subject. Let us begin with the bases. These are discovered to be metalic oxydes, the pure metals of which were obtained by Sir Humphrey Davy, and they are denominated respectively potassium, sodium, calcium, and magnesium and bone barytes, barium, &c. But potassium, which is the one most easily obtained, may be taken as a type of the class. It is a glittering metal, much like silver, but clear as water. It has some quality in common with sodium. When a current of water is passed over it, it is decomposed with great rapidity, devolving its oxygen. It often changes red color to blue. It combines with other acids, forming neutral salts, which are obtained by evaporation. The other alkaline metals follow the same process, but not so readily as potassium. The proportions in which they combine are 50 parts potassium, 8 of oxygen; making 48 of potassa, 24 parts of sodium, with 8 of oxygen, making 32 of soda.

Knowing the great importance of this to a farmer to know what amount his soil contains of potash, or of soda, we present them distinctly. Take a portion of the soil, and put it into boiling water, and then strain it through a filter. The water will extract all the soluble portions; then dry by evaporation, and the salt remaining will show by its form, its solubility, and by the action of the air upon it when exposed, what base it contains. That base will generally be found combined with sulphuric acid. When sulphate of potash is present, it will be discovered by its slow solution and its permanency when exposed to the air. Some plants receive from the soil minute portions of alkali, while others absorb an immense quantity. Some plants, Montena for example, contain a considerable quantity of sulphurs, which, combining with oxygen, developes the offensive gas sulphurated hydrogen, as is often found in fire-arms when neglected; and with putrid eggs. To this is owing the nauseous smell of water in

which vegetables may have been cooked. So with the water near the mouths of rivers, especially on the coast of Africa. The copper of ships anchored there rapidly decays, and this is the attributed cause of the unhealthiness of those shores. The best test of its presence is sugar of lead in solution, which in a short time shows itself producing sulphuret of lead. Sulphurretted hydrogen is then unquestionably pernicious to animal life, but not to vegetables, for to some of them sulphur is necessary; it is essential in mustard, cabbages, and in a large class of plants.—*Scientific American.*

No. 7.

Valuable Discovery.

Messrs. Quarterman & Son, of No. 18 Burling Slip, this city, have made a valuable discovery in the mode of mixing paints, for which they have applied for letters patent. All artists' colors can be prepared in the composition, will keep moist for years and will mix either in turpentine, oil, or water. All paints prepared in this manner preserve their brilliancy much longer and are more durable than those prepared in the old way. This new mode is also applicable to paints used in house and ship painting. It is also so cheap and so simple in its application, that any painter or manufacturer can adopt it readily.—*Ib.*

No. 8.

New Threshing and Cleaning Machine.

Mr. N. B. Lucas, of Jefferson county, Illinois, has invented a new Threshing and Winnowing Machine, which can thresh and clean with ease 600 bushels of oats in a day, and about 500 of wheat. It threshes damp grain well separating the damp grain from the straw easily. The inventor says that there is no machinery that winds with damp straw; no elevators to choke; no hand required to pitch straw from the machine, as the machinery throws it in a pile, to be taken with a horse rake, and thereby saves the labor of a man.—*Ib.*